

PATENT

Docket No. 53473US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Clinton P. WALLER, Jr., et al.

Group Art Unit: 1774

Serial No.: 08/892,902

Examiner: M. Yamnizky

Confirmation No.: Unknown

Filed: 14 July 1997

For: **MICROPOROUS INKJET RECEPTORS CONTAINING BOTH A PIGMENT
MANAGEMENT SYSTEM AND A FLUID MANAGEMENT SYSTEM**

DECLARATION OF CLINTON P. WALLER, JR.

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

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I, Clinton P. Waller, Jr., declare and say as follows:

1. I am a co-inventor of the subject matter claimed in the above-identified
U.S. Patent Application Serial No. 08/892,902, filed July 14, 1997.

2. I have read the Office Action mailed on December 11, 1997, and make the
following Declaration in support of the patentability of the claims.

3. To demonstrate the visual difference between an image printed using
pigment-based inks printed both with and without a pigment management system and a fluid
management system, as well as the visual difference between an image printed using dye-based
inks printed both with and without a pigment management system and a fluid management
system, I produced the example images included herewith. All example images were imaged in
the same manner on the same type of substrate using the same printer and print mode. Each
example was imaged on a Thermally Induced Phase Separated microporous membrane as

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disclosed in U.S. Patent Nos. 4,539,256 (Shipman et al.), 4,726,989 (Mrozinski), and 5,120,594 (Mrozinski), the disclosures of which are incorporated into the above-captioned patent application. The examples were imaged using a Hewlett Packard 2500 CP color printer set on uv custom vinyl mode (print mode), at 600 dpi and approximately 30 pl drop size.

IMAGES PRINTED WITH DYE-BASED INKS

4. Exhibit A was imaged using dye-based inks on a substrate that did not include either a pigment management system or a fluid management system. The right side of the image was then subjected to a water wash by holding the right side of the image under running water for 15-20 seconds, without manually wiping the image. The left side of the image showed figures that were not sharp and distinct, with colors that were muted and had very little contrast. The water wash caused further deterioration of the image, producing bleeding and spotting of the ink.

5. Exhibit B was imaged with dye-based inks on a substrate that did include both a pigment management system and fluid management system that included a solution of 5% by weight (wt-%) $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$, 8 wt-% Dioctylsulfosuccinate-Na-salt (DOS), 30 wt-% isopropyl alcohol, and 57 wt-% water. This composition, that includes both a pigment management system and a fluid management system, was applied to the membrane substrate by flooding the substrate with the solution and then wiping the substrate with a glass rod. The substrate was then dried with a hot air gun prior to printing the image. An image using dye-based inks was then produced on the substrate. The right side of the image was then subjected to a water wash as for Exhibit A.

6. The left side of the image of Exhibit B showed some improvement in contrast and sharpness of image as compared to Exhibit A. However, neither image of Exhibit A or B was not of acceptable quality. The areas of both images A and B that were subjected to

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water exhibited significant bleeding, spotting, and loss of color, and there was little if any apparent difference between the washed areas of Exhibit A (without a pigment management system and a fluid management system) and the washed areas of Exhibit B (with a pigment management system and a fluid management system).

IMAGES PRINTED WITH PIGMENTED-BASED INKS

7. Exhibit C was imaged using HP pigmented uv inks on a substrate that did not include either a pigment management system or a fluid management system. The resulting image was poor quality with feathering, low optical density, and poor contrast. The image was less distinct than the image formed with the dye-based inks on the substrate without a pigment management system and a fluid management system (Exhibit A). The left side of the image of Exhibit C was subjected to a water wash as performed for Exhibit A. A significant amount of the pigment was washed away; however, there was less spotting and bleeding of the image printed with pigmented-based ink as compared with the washed image printed with dye-based ink (Exhibit A).

8. Exhibit D was imaged using HP pigmented ink on a substrate that did include both a pigment management system and a fluid management system that included a solution of 5% by weight (wt-%) $\text{Al}_2(\text{SO}_4)_3 \cdot 18\text{H}_2\text{O}$, 8 wt-% DOS, 30 wt-% isopropyl alcohol, and 57 wt-% water. This composition, including both a pigment management system and a fluid management system, was applied to the substrate as was done for Exhibit B, and an image was printed on the substrate with pigmented inks. The image formed was significantly sharper than the pigment-based ink image formed without the pigment management system and fluid management system (Exhibit C). There was no bleeding of color, the contrast and image detail were significantly improved, and there was a higher optical density. The left side of the image was subjected to a water wash in the same manner as for Exhibit A. Little or no pigment was washed away after being subjected to the wash.

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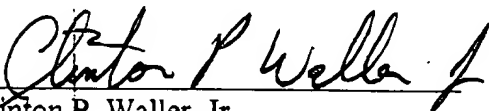
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9. Comparing Exhibits A and C, it is apparent that an image using a dye-based ink can have a very different appearance than the same image printed on the same type of substrate using a pigmented-based ink. Also, in comparing the difference in the image quality between Exhibits A and B, versus the difference in image quality between Exhibits C and D, it is apparent that use of the composition including both a pigment management system and a fluid management system does little to improve the quality and water-fastness of the images printed with dye-based inks. However, use of the composition including a pigment management system and a fluid management system significantly improves the quality and water-fastness of images printed with pigment-based inks.

10. I further declare that statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.


Clinton P. Waller, Jr.

12/21/01
Date

EXHIBIT
A

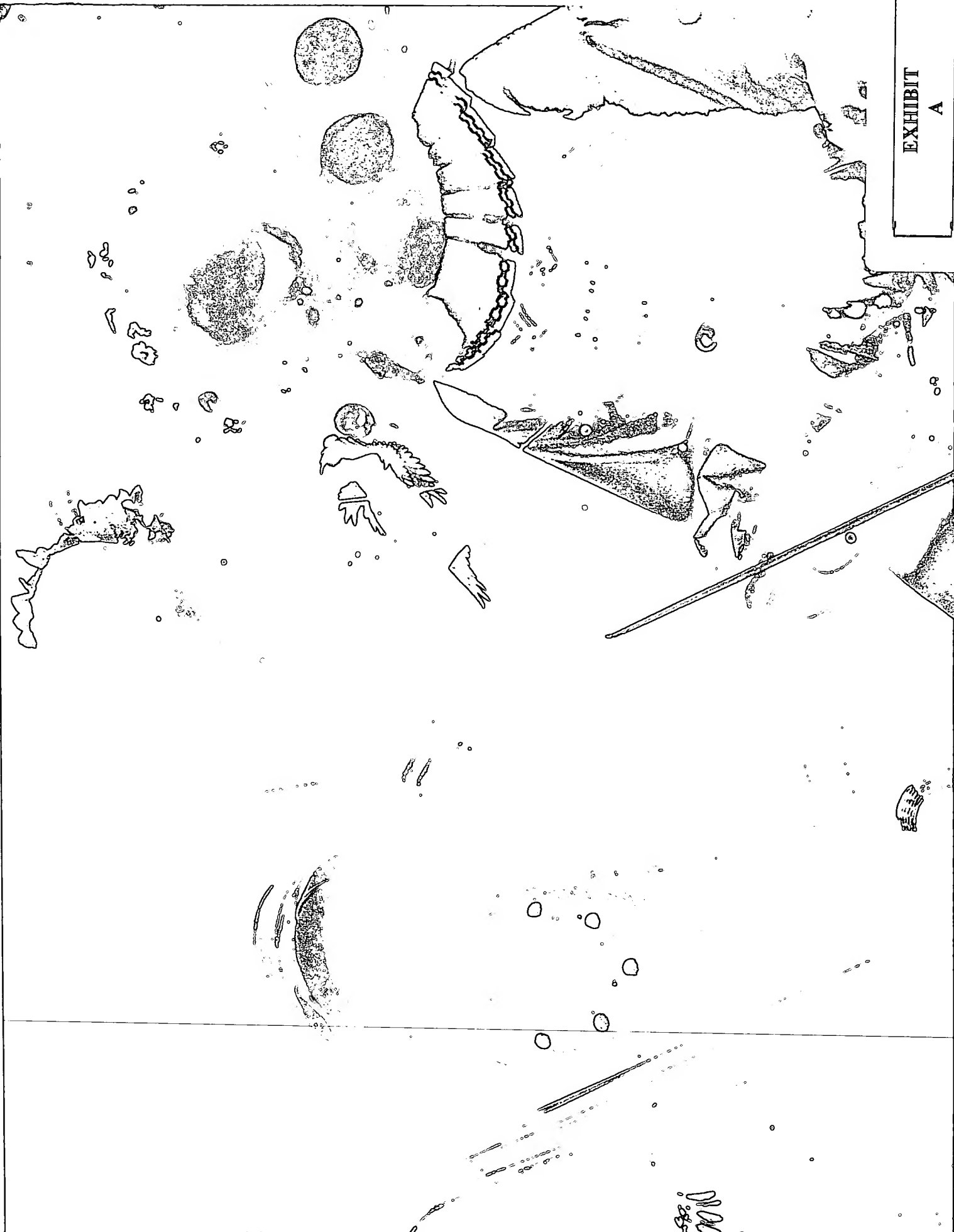


EXHIBIT
B

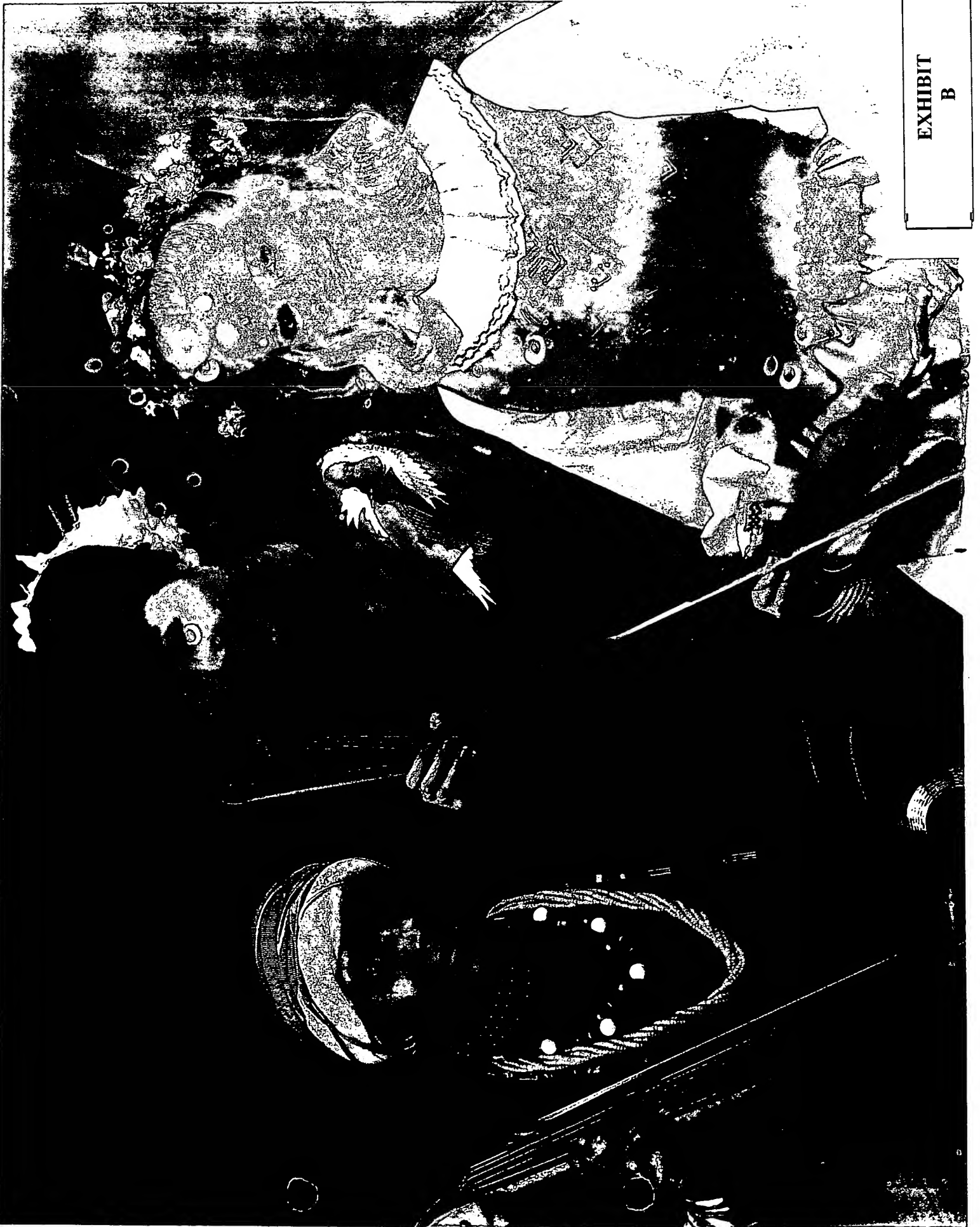


EXHIBIT
C

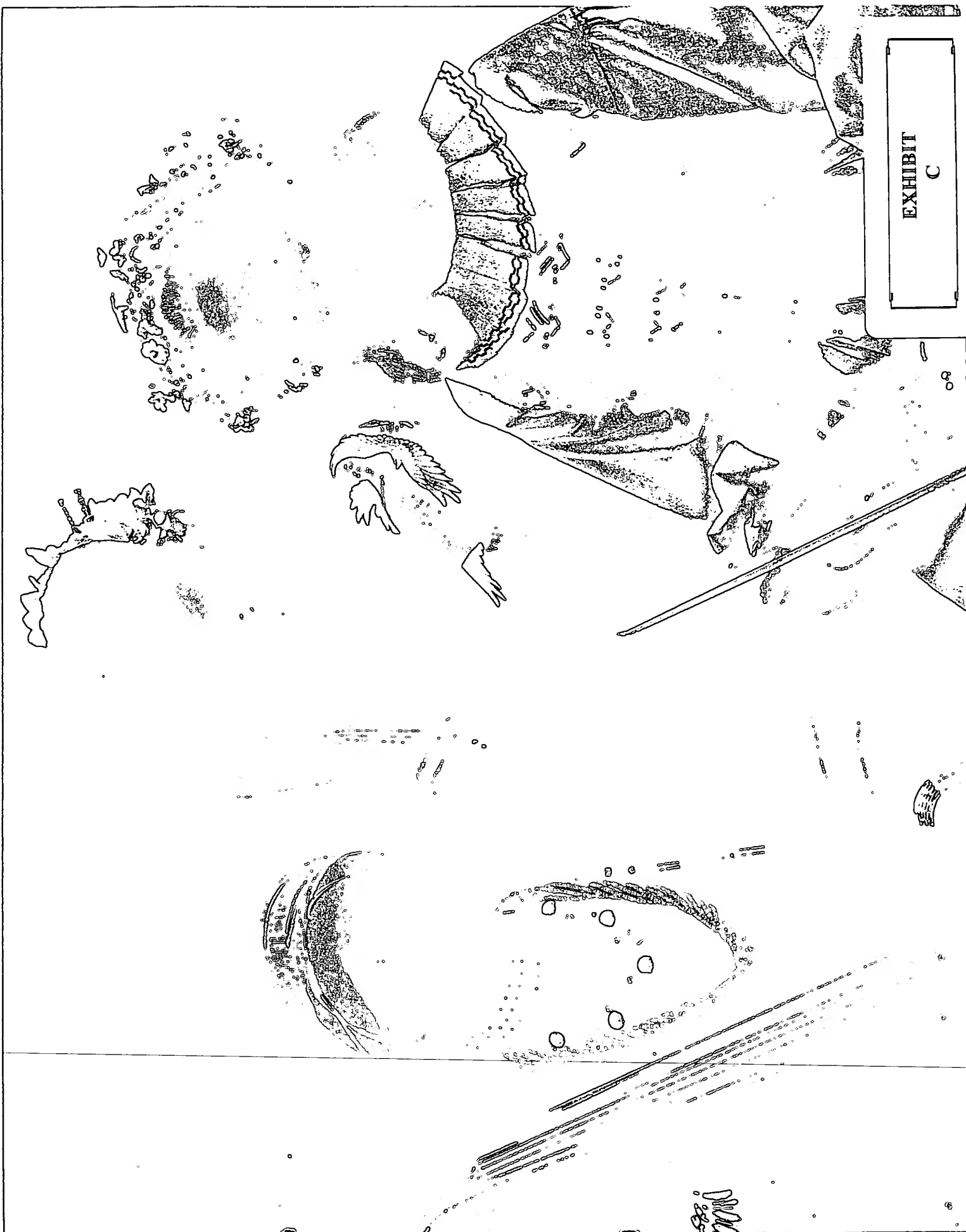
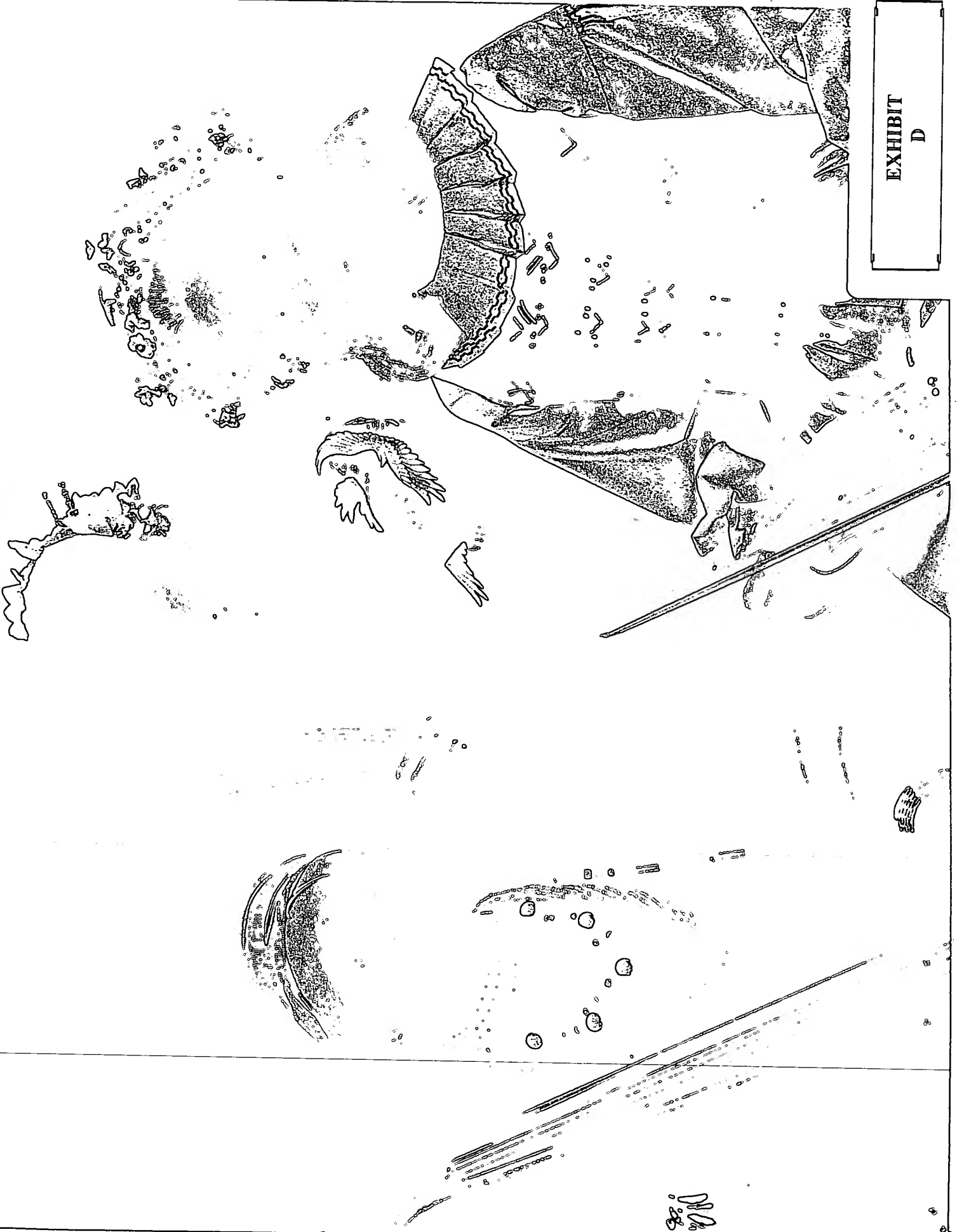


EXHIBIT
D



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